

Question 01.

```
public class q01 {  
    void calculateGrade(int score){  
        if(score >= 90 && score <= 100){  
            System.out.println("Your grade is: A");  
        } else if (score >= 80 && score <= 89) {  
            System.out.println("Your grade is: B");  
        } else if (score > 100 || score < 0) {  
            System.out.println("Error: Please enter a score between 0 and  
100.");  
        } else if ( score <= 79) {  
            System.out.println("Your grade is: C");  
        }  
    }  
}
```

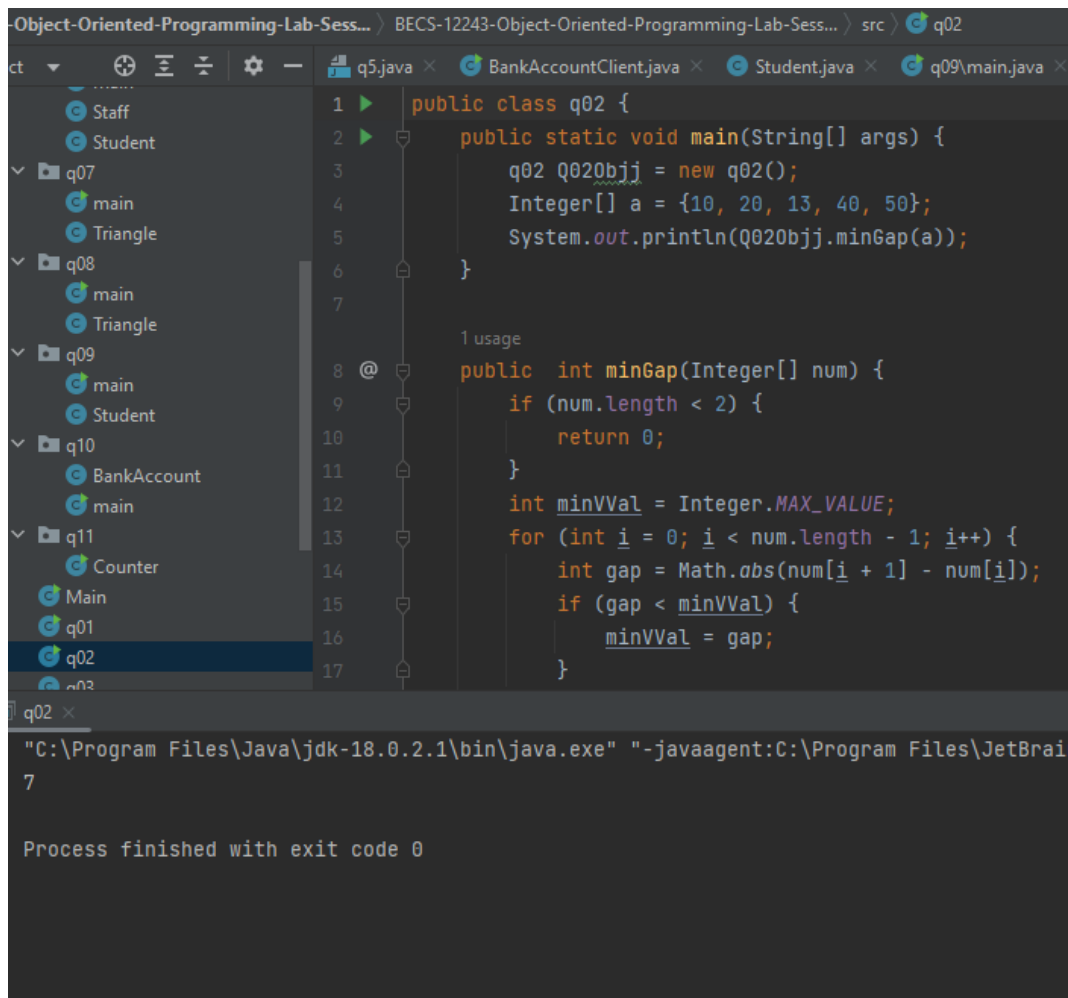
```
public static void main(String[] args) {  
    q01 q01obj = new q01();  
    q01obj.calculateGrade(score: 25);  
    q01obj.calculateGrade(score: -25);  
    q01obj.calculateGrade(score: 85);  
}
```

q01 x

```
"C:\Program Files\Java\jdk-18.0.2.1\bin\java.exe" "-javaagent:C:\Program Files\J  
Your grade is: C  
Error: Please enter a score between 0 and 100.  
Your grade is: B  
Process finished with exit code 0
```

Question 02.

```
public class q02 {  
    public static int minGap(Integer[] num) {  
        if (num.length < 2) {  
            return 0;  
        }  
        int minVVal = Integer.MAX_VALUE;  
        for (int i = 0; i < num.length - 1; i++) {  
            int gap = Math.abs(num[i + 1] - num[i]);  
            if (gap < minVVal) {  
                minVVal = gap;  
            }  
        }  
        return minVVal;  
    }  
}
```



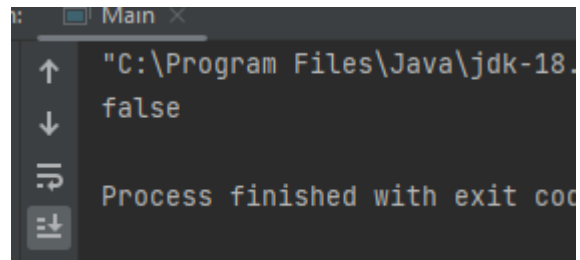
The screenshot shows an IDE window titled "Object-Oriented-Programming-Lab-Sess..." with a project named "BECS-12243-Object-Oriented-Programming-Lab-Sess...". The source code for class "q02" is displayed, showing the implementation of the "minGap" method. The code is as follows:

```
1 public class q02 {  
2     public static void main(String[] args) {  
3         q02 Q020bjj = new q02();  
4         Integer[] a = {10, 20, 13, 40, 50};  
5         System.out.println(Q020bjj.minGap(a));  
6     }  
7  
8     1 usage  
9     public int minGap(Integer[] num) {  
10         if (num.length < 2) {  
11             return 0;  
12         }  
13         int minVVal = Integer.MAX_VALUE;  
14         for (int i = 0; i < num.length - 1; i++) {  
15             int gap = Math.abs(num[i + 1] - num[i]);  
16             if (gap < minVVal) {  
17                 minVVal = gap;  
18             }  
19         }  
20     }  
21 }
```

The output window shows the command executed: "C:\Program Files\Java\jdk-18.0.2.1\bin\java.exe" "-javaagent:C:\Program Files\JetBrai" and the message "Process finished with exit code 0".

Question03.

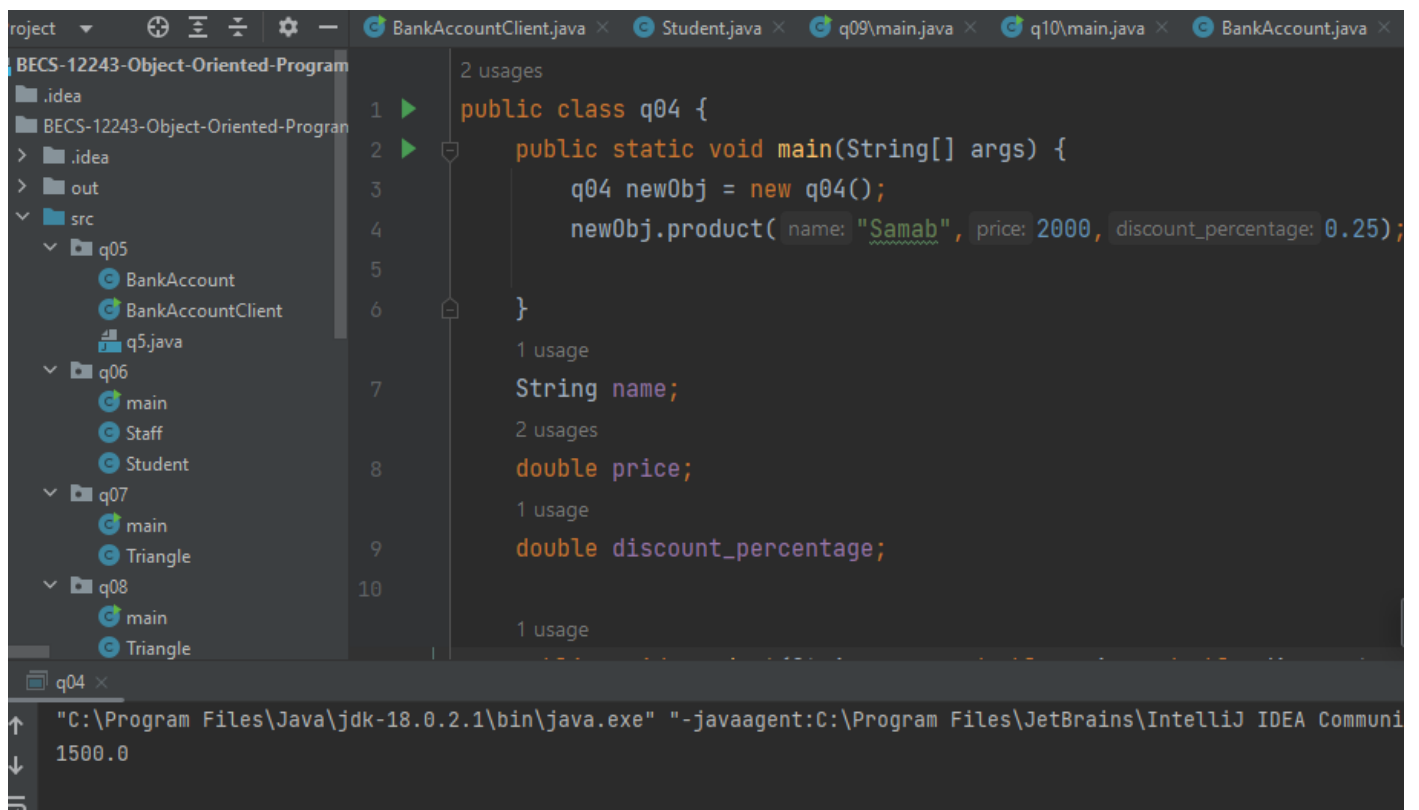
```
public class q03 {  
    boolean allLess(int[] a, int[] b){  
        boolean status = false;  
        int i = 0;  
        if (a.length != b.length){  
            status= false;  
        }  
        else {  
            for (int j = 0; j < a.length; j++) {  
                if (b[j]-a[j]<0){  
                    status = false;  
                    break;  
                }  
                else {  
                    status = true;  
                }  
            }  
        }  
        return status;  
    }  
}
```



```
public class Main {  
    public static void main(String[] args) {  
        int[] a = {10, 200, 30, 40, 50};  
        int[] b = {35, 50, 60, 73, 55};  
        q03 obj3 = new q03();  
        System.out.println(obj3.allLess(a,b));  
    }  
}
```

Question 04.

```
public class q04 {  
    String name;  
    double price;  
    double discount_percentage;  
  
    public double product(String name, double price, double  
discount_percentage) {  
        this.name = name;  
        this.price = price;  
        this.discount_percentage = discount_percentage;  
        return this.price*(1-discount_percentage);  
    }  
}
```



Question 05.

No. Only one Public class can only created per one java file. But we can have many non public classes in a single java file.

error: class <BankAccount> is public, should be declared in a file named <BankAccount.java>

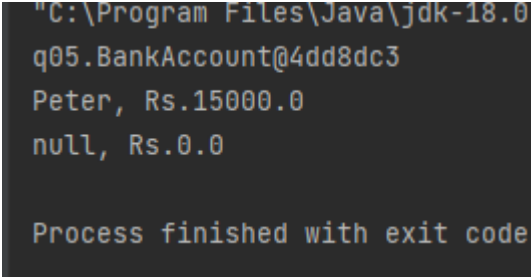
```
package q05;

public class BankAccountClient {
    public static void main(String[] args) {
        BankAccount B1 = new BankAccount("Peter",10000);
        B1.deposit(8000);
        B1.getBalance();
        B1.withdraw(3000);
        System.out.println(B1);
        B1.displayInfo();
        BankAccount B2 = new BankAccount();
        B2.displayInfo();
    }
}
```

```
package q05;

public class BankAccount {
    private String name;
    private double balance;
    public BankAccount() {
        this.name = null;
        this.balance = 0;
    }
    public String getName() {
        return name;
    }
    public double getBalance() {
        return balance;
    }
}
```

```
}  
  
public void deposit(double amount){  
    this.balance += amount;  
}  
  
public void withdraw(double amount){  
    this.balance -= amount;  
}  
  
public void displayInfo() {  
    System.out.println(this.name+", Rs."+this.balance);  
}  
  
public BankAccount(String name, double balance) {  
    this.name = name;  
    this.balance = balance;  
}  
  
}
```



```
"C:\Program Files\Java\jdk-18.0  
q05.BankAccount@4dd8dc3  
Peter, Rs.15000.0  
null, Rs.0.0  
  
Process finished with exit code
```

Question 06.

```
package q06;

public class main {

    public static void main(String[] args) {

        Staff drSaman = new Staff("1111","Dr. Saman
Perera","sasasa@sasa.ss",725196700,"U001",2500,"Computer Science");

        Student nilanka = new Student("9999","Ms. Nilanka
Silva","nils@stu.kln.ac.lk",726677555,"PS/2016/001", (short) 2,5,"Royal");

        drSaman.displayStaffInfo();

        System.out.println();

        drSaman.sallaryIncrement();

        System.out.println();

        drSaman.displayStaffInfo();

        System.out.println();

        System.out.println("-----");

        System.out.println();

        nilanka.displayStaffInfo();

        System.out.println();

        nilanka.GpaIncrease();

        nilanka.displayStaffInfo();

    }

}
```

```
public class Staff {  
    String NIC;  
    String Name;  
    String Email;  
    int ContactNumber;  
  
    String UniversityID;  
    private double Salary;  
    String Department;  
  
    public Staff(String NIC, String name, String email, int contactNumber,  
String universityID, double salary, String department) {  
        this.NIC = NIC;  
        Name = name;  
        Email = email;  
        ContactNumber = contactNumber;  
        UniversityID = universityID;  
        Salary = salary;  
        Department = department;  
    }  
  
    public void displayStaffInfo(){  
        System.out.println(NIC);  
        System.out.println(Name);  
        System.out.println(Email);  
        System.out.println(ContactNumber);  
        System.out.println(UniversityID);  
        System.out.println(Salary);  
        System.out.println(Department);  
    }  
}
```



```
public void sallaryIncrement(){  
    if (Department=="Computer Science"){  
        this.Salary = Salary + Salary*0.05;  
    }  
}  
}
```

```
package q06;  
  
public class Student {  
    String NIC;  
    String Name;  
    String Email;  
    int ContactNumber;  
    String UniversityID;  
    short AcademicYr;  
    private double GPA;  
    String Path;  
  
    public Student(String NIC, String name, String email, int contactNumber,  
String universityID, short academicYr, int GPA, String path) {  
        this.NIC = NIC;  
        Name = name;  
        Email = email;  
        ContactNumber = contactNumber;  
        UniversityID = universityID;  
        AcademicYr = academicYr;  
        this.GPA = GPA;  
        Path = path;  
    }  
  
    public void displayStaffInfo(){  
        System.out.println(NIC);  
        System.out.println(Name);  
    }  
}
```

```
        System.out.println(Email);

        System.out.println(ContactNumber);

        System.out.println(UniversityID);

        System.out.println(AcademicYr);

        System.out.println(GPA);

        System.out.println(Path);

    }
```

```
void GpaIncrease(){
    if (this.AcademicYr == 2){
        GPA+=0.0001;
    }
}

}
```

```
Run: main x
"C:\Program Files\Java\jdk-18.0.2.1\bin\java.exe" "-
1111
Dr. Saman Perera
sasasa@sasa.ss
725196700
U001
2500.0
Computer Science

1111
Dr. Saman Perera
sasasa@sasa.ss
725196700
U001
2625.0
Computer Science

-----

9999
Ms. Nilanka Silva
nils@stu.kln.ac.lk
726677555
PS/2016/001
2
5.0
Royal

9999
Ms. Nilanka Silva
nils@stu.kln.ac.lk
726677555
PS/2016/001
2
5.0001
Royal

Process finished with exit code 0

Build completed successfully in 2 sec, 95 ms (3 minutes ago)
```

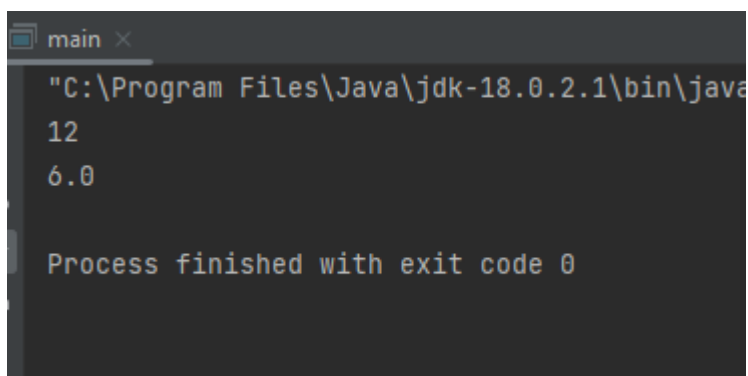
Question 07.

```
package q07;

public class Triangle {
    private int side1 = 3;
    private int side2 = 4;
    private int side3 = 5;
    public int Perimeter() {
        return side1+side2+side3;
    }
    public double Area() {
        return (side1*(double)side2)/2;
    }
}

package q07;

public class main {
    public static void main(String[] args) {
        Triangle t1 = new Triangle();
        System.out.println(t1.Perimeter());
        System.out.println(t1.Area());
    }
}
```



```
main x
"C:\Program Files\Java\jdk-18.0.2.1\bin\java
12
6.0
Process finished with exit code 0
```

Question 08.

```
package q08;

public class Triangle {
    private int side1;
    private int side2;
    private int side3;

    public Triangle(int side1, int side2, int side3) {
        this.side1 = side1;
        this.side2 = side2;
        this.side3 = side3;
    }

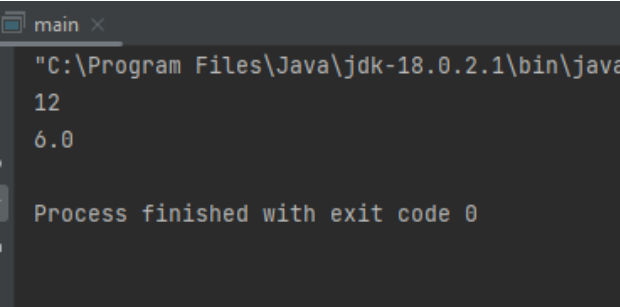
    public int Perimeter() {
        return side1+side2+side3;
    }

    public double Area() {
        return (side1*(double)side2)/2;
    }
}
```

```
package q08;
```

```
public class main {

    public static void main(String[] args) {
        Triangle t1 = new Triangle(3,4,5);
        System.out.println(t1.Perimeter());
        System.out.println(t1.Area());
    }
}
```



```
main x
"C:\Program Files\Java\jdk-18.0.2.1\bin\java
12
6.0

Process finished with exit code 0
```

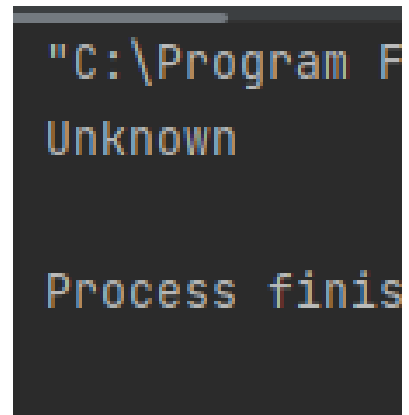
Question 09.

```
package q09;

public class Student {
    private String name = "Unknown";
    public Student(String name) {
        this.name = name;
    }
    public Student(){
    }
    public String getName() {
        return name;
    }
}

package q09;

public class main {
    public static void main(String[] args) {
        Student s1 = new Student();
        System.out.println(s1.getName());
    }
}
```



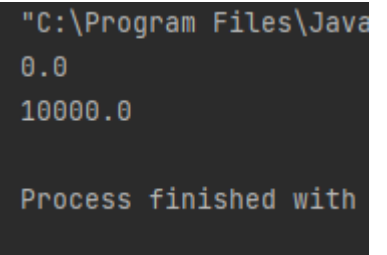
```
"C:\Program F
Unknown

Process finis
```

Question 10.

```
package q10;
```

```
public class main {  
    public static void main(String[] args) {  
        BankAccount bankAccObj = new BankAccount();  
        BankAccount bankAcc00bj = new BankAccount(10000);  
        System.out.println(bankAccObj.getInitial_amount());  
        System.out.println(bankAcc00bj.getInitial_amount());  
    }  
}
```



```
"C:\Program Files\Java  
0.0  
10000.0  
  
Process finished with
```

```
package q10;
```

```
public class BankAccount {  
    private double initial_amount = 0;  
    public BankAccount(double initial_amount) {  
        this.initial_amount = initial_amount;  
    }  
    public BankAccount() {  
    }  
    public double getInitial_amount() {  
        return initial_amount;  
    }  
}
```

